

UNITED STATES PATENT OFFICE

Utility Patent Application

AN ALGORITHM FOR ADJUSTING EDGES OF GRayscale PIXEL-MAP IMAGES

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ABSTRACT OF THE INVENTION

An algorithm (method) for sizing (adjusting edges of) grayscale or dose level pixel-maps (raster images) real time for input into radiant beam lithography systems or similar dose level grayscale image rendering systems to compensate for systemic distortions such as edge bias and/or loss of linearity (i) successively assembles one or more frame matrixes of grayscale values from a parent pixel-map having edges and corners where an edge is defined by gray pixels having values between 1, 2, ...n, or by pixels having at least one black (0-gray or dose level) neighbor; (ii) slides a sub-matrix window within each frame matrix, to find, calculate and store values for gradients perpendicular to the edges, and any corner within each frame matrix; (iii) loops over pixels within such sub-matrix window at each position within the frame matrix to adjust the grayscale value of each edge pixel found; and (iii) propagates a grayscale correction value to pixels inward or outward per the computed perpendicular gradient to establish a new edge position within each frame matrix, and where there is more than one frame matrix , (iv) reassembles the frame matrixes, thereby, generating a daughter grayscale or dose level pixel-map which upon projection and recording compensates for systemic distortions.